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ABSTRACT

In addition to facilitating computer-assisted and computer-managed instruction, microcomputers are increasingly being used to control video players in an application called Interactive Video, through which the instructor can block a video program into segments and insert textual introductions, questions, or explanations where needed. One such program, Guided Exposure to Microcomputers (GEM), was developed primarily to familiarize Miami-Dade Community College faculty with microcomputers and the potentials of interactive video programming. The GEM program requires the use of an Apple II Plus microcomputer, a television, an ETS 2000 Interactive Video Interface for Betamax with accompanying coursewriter software, and a Sony Betamax video player. As GEM explains, there are nine steps in writing an interactive video program: (1) select the videotape; (2) view the tape to determine how it should be segmented; (3) flow chart the lesson plan; (4) write the necessary introduction, explanations, and questions; (5) transfer the material to be inserted onto a screen layout form; (6) input the textual materials onto the minicomputer disk; (7) block the video tape into segments; (8) program the computer to control the sequence from video display to written text; and (9) test the program. The report outlines the topics covered in the GEM program and presents guidelines for each of the nine steps in preparing the interactive video program. (JP)

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GEM

Guided Exposure to Microcomputers

An Interactive Video Program

Developed by
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JC 810 465

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Miami-Dade Community College
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GEM

Guided Exposure to Microcomputers

I. Introduction

The microcomputer revolution is no longer in the making. It is here to the left of us, to the right of us, in front of us, behind us, and in short, upon us. In education, there is a growing interest in exploiting the microcomputer technology for improving instruction and, thereby, student learning. There are many ways to use this technology to enhance instruction and learning. The most frequently mentioned use, of course, is CAI (computer-assisted instruction), in which the student receives instruction directly from the computer. Another use, called CMI (computer-managed instruction), functions as a support for the instructor to do a better job of managing students' learning on an individual basis. Beside these two popular thrusts, microcomputers can be programmed to control the operation of several other instructional tools--for example, video players (cassette or disk) and input/output devices such as the Scan-Tron unit or optical-mark card reader and a printer. When the microcomputer is used to control the video player, the application is called Interactive Video. One of the major advantages of Interactive Video is that it transforms the viewer from a passive observer to an active participant. Interactive Video also provides an opportunity for the faculty member to introduce the video program, interrupt it at any given point, ask questions about what has been viewed thus far, or give explanations about the ensuing segment. In the event that the students miss a question, Interactive Video also allows the instructor to route the student back to the video segment that pertains to the question. All of these manipulations are done automatically through programming

the microcomputer. The GEM program is an example of Interactive Video using video cassettes.

II. The GEM Program

Guided Exposure to Microcomputers (GEM) utilizes the video series entitled "Little Computers...See How They Run," produced by Evolution 1, a division of the Electronic Data Systems Corporation, 14580 Midway Road, Dallas, Texas 75244. The four video tapes in the series describe what microcomputers are all about and what they can do by examining the outside and inside of microcomputers such as the Apple, the TRS80, the Atari, the Texas Instruments, and the PET microcomputers. The topics covered are as follows:

1. Meet the Computer
2. Inside the Computer
3. CPU & Memory
4. Mass Storage Devices
5. Keyboard, CRT, and Printers
6. Making Things Happen
7. Data Communication
8. Speech, Music & Graphics

The equipment that is needed to participate in the GEM program is as follows:

1) Apple II Plus microcomputer with 48K memory
2) A television or monitor for the video display
3) ETS 2000 Interactive Video Interface for Betamax with accompanying coursewriter software
4) Sony Betamax video player

The state of Florida has a contract for distribution of the television series "Little Computers...See How They Run" and a set is available for Miami-Dade

Community College.

In utilizing this television series, the GEM program expects to accomplish the following specific objectives:

1) Provide an orientation about microcomputers to uninitiated persons
2) Provide an opportunity to learn the vocabulary associated with microcomputers
3) Provide an understanding of the criteria for selection of a microcomputer
4) Provide an opportunity for the faculty members to participate in an interactive video program and thereby see its potential for developing interactive video for their own courses

Thus, the GEM program, developed primarily for the faculty members of Miami-Dade Community College, has a two-pronged approach--provide a visual orientation to microcomputers and an exposure to the potentials of Interactive Video.

At this time, the equipment described above for running the GEM program is available in the Office of Computer-Based Instructional Development and Research, which is located in Room 2202 at South Campus. It is hoped that, as more faculty get to know the GEM program, each campus will be able to supply itself with the necessary equipment.

Caution: The coursewriter software that accompanies ETS 2000 interface has some limitations. Fortunately, we were able to modify it and thereby make it more convenient and efficient for people to use. Should you get your own equipment, kindly contact us so that we can provide you with some necessary modifications.

III. Lesson Development for Interactive Video

In this section, we will provide a brief description of the steps involved in developing a lesson for Interactive Video. We hope this will offer a guideline rather than function as an explicit manual. Should you have interest in this area, we will be available to help with your lesson development.

Step 1 - Select the video tape(s) that you would like to use for Interactive Video.

Step 2 - View the video tape(s) repeatedly in order to determine what is important in the information presented through the video tape. Questions such as "Should I give an introduction before the student views the tape?" and "Which are the strategic points in the tape that I should interrupt and either ask a question about or give a further explanation of?" are helpful in conceptualizing the Interactive Video lesson.

Step 3 - Design the Interactive Video lesson by using a method called "informal flow charting." In this type of designing, a large bulletin board, 2x2 index cards, and colored yarns are very handy. The 2x2 index cards are used to represent the video segments, questions, and explanations; and the colored yarns are used to indicate branching, back-tracking, and moving forward. With such an arrangement, it is easy to move the cards around until a satisfactory design is formulated. At this point, as the content aspects become clearer in the planner's head, some notations can be made on the cards for future guidance.

Caution: This place is as good as any other place to mention that ETS 2000 has a limitation of 40 frames (or screens) for explanations and questions (both put together) for any single lesson, and each video tape forms the basis for a single lesson. The screens are numbered, each with a unique number 1-40. Also, there are only five ways to branch after a question: 1) text only; 2) video only; 3) text, then video; 4) video, then text; or 5) text, video, and then text.

Step 4 - Once the informal flow charting is crystallized on the bulletin board, write the necessary introduction, explanations, and

questions on the 2x2 cards.

Step 5 - Transfer the written statements and questions to a screen layout form, a copy of which is attached. This form represents the video screen available for text--22 lines of 40 characters each. Completing these coding sheets helps in positioning the explanations and questions exactly the way they would appear for the student. Although this step may appear cumbersome, and it is very tempting to sit at the Apple computer and start typing in the information, believe us when we say that it is far, far better, in the long run, to start with the coding sheets, particularly when it comes to revisions.

Step 6 - Input the text materials (explanations and questions) using the ETS 2000 software in the Apple computer and a disk that we will call a "work" disk. From the following menu that will appear on the TV screen, option 1 is used to create an Interactive Video lesson:

1) Create a C.V.E. program;

2) Test run of created program;

3) Make a copy of C.V.E. program; and

4) End.

A second level menu allows the following options for entering information:

1) Text screen;

2) Video blocks;

3) Logic; and

4) Return to main menu.

A third level menu presents the following choices:

1) Enter new text screens;

2) Update old text screens;

3) Enter new questions and answers;

4) Update old questions and answers; and

5) Return to authoring selection menu.

If a printer is attached to the Apple computer, a special program called "PRINT IT" can be used to print all or some of the text screens for review and editing. The modifications we have made in the ETS 2000 software allow the user to edit any line of any screen at any time.

Step 7 - Block the video tape according to the segments you have identified earlier. In the second level menu presented by ETS 2000, select option 2 for video blocking. The tape is played from the beginning and has to be blocked from beginning to end, even though some of the blocks may not be used in the lesson. This is an advantage because those segments of the video tape that are not of much relevance to the course can thus be omitted. Each block is numbered sequentially and its beginning and ending indicated by starting and stopping the video tape at the appropriate places. Unfortunately, ETS 2000 does not permit editing. If even <u>one</u> blocking goes wrong, the entire video tape has to be blocked from the beginning.

Step 8 - <u>Programming the Logic</u>. Use the logic layout form (copy attached) to prepare for programming the logic. The logic determines the sequence of presentations from screen to video tape, back to screen, branching either to screen or video tape, etc. In each step of the logic, three choices are available as follows:

1. Display video;
2. Display a text screen; or
3. Display a question screen.

As the choices are exercised, the video block, text screen, or question screen is identified by its number. For the question screen, the logic continues

further to program the branching contingent upon students' correct or incorrect answers. As mentioned earlier, the branching can take one of five routes:

1. Text only;
2. Video only;
3. Text, then video;
4. Video, then text; or
5. Text, then video, then text.

As in blocking, logic has to be redone from the beginning even if only one error occurs. Steps 6, 7, and 8 are accomplished on a work disk and then copied to a "play" disk. The work disk functions as a back-up copy. This is a very important step because if you lose one disk, you lose a great deal of your work, time, and effort; therefore, a back-up is a must.

Step 9 - Test the video interactive lesson by using Option 2 in the main menu.

V. Conclusion

Interactive video is a fascinating way of instructing students. We hope that the GEM program will function as a starting point for the faculty to experiment with this concept. In addition, we hope that the information on microcomputers presented through the GEM program functions as a starting point for learning about microcomputers.

GENTECH

SCREEN LAYOUT FORM

Screen # _____

Text ☐

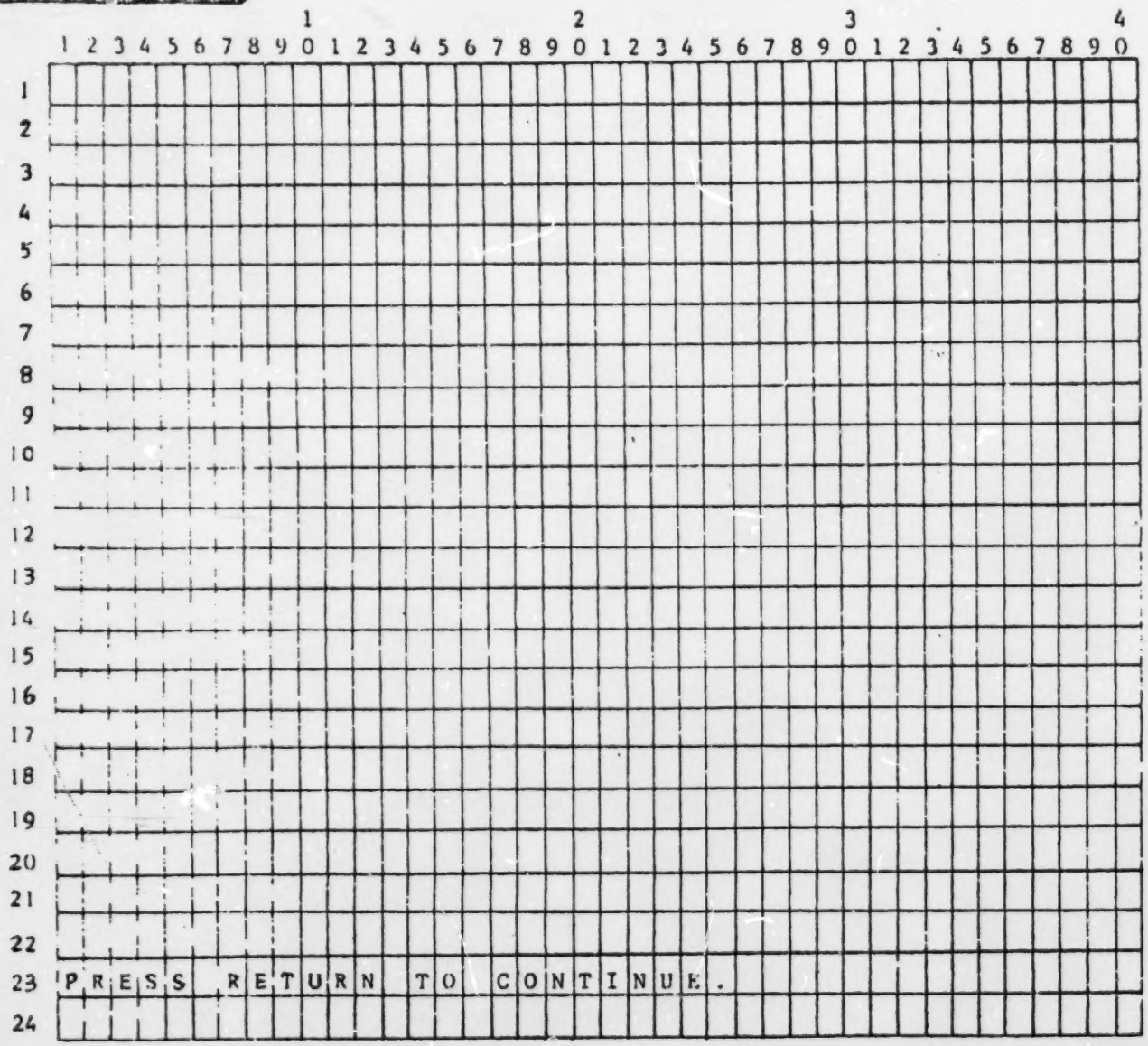
Question ☐

Program _____

Version _____

Author _____

Date _____



NOTE:

Lines 22-24 are not available for input.

On "question" screens, "ENTER ANSWER, THEN RETURN" will appear on Line 23.

LOGIC LAYOUT FORM

PROGRAM NAME: _____

AUTHOR(S): _____ PAGE _____ OF _____

LOGIC STEP NUMBER	ACTION TAKEN TYPE V, T, Q, or E	ACTION TAKEN V, T, or Q Number	ACTION TAKEN FOR CORRECT RESPONSE	ACTION TAKEN FOR INCORRECT RESPONSE